

I. The Relation of the Area to the Research Work of the Region and Its Needs in Connection Therewith.

The Boise Basin Experimental Forest will make permanently available an area for concentrating silvicultural and other related forest research in the ponderosa pine type on granitic soils in the Intermountain Region. Ponderosa pine is the most important commercial timber species in the region. Its occurrence in central Idaho differs from that in other regions where research in methods of cutting, etc., is being conducted in that it grows chiefly on a coarse granitic soil, a factor which influences more or less the establishment, rate of growth, etc., of the species as compared to other soils and other climates. The total area of the ponderosa pine type in central Idaho in the Intermountain region, occurring largely on granitic soils, is approximately 1,879,000 acres of which 1,276,000 acres is federal land, 158,000 acres belongs to the state of Idaho, 3,000 acres to counties and 442,000 acres is privately owned. Of the total acreage 1,579,000 acres bears mature timber, 9600 acres bears cord wood stands, 114,000 is restocking and 90,000 acres is deforested. The saw timber stand is estimated to amount to 18,797 million board feet. Ponderosa pine also occurs to a considerable extent on granitic soils in the Northern Rocky Mountain and Pacific Northwest regions. The results of research performed on the Boise Basin Experimental Forest will apply more or less to all of this timber land. Definite plans for research work in this type can best be carried out on an experimental forest area.

The proposed Boise Basin Experimental Forest is the most representative area of virgin ponderosa pine timber available, that is also reasonably accessible and for which there is reasonable assurance of a market for the annual cut. Within Boise Basin in which the proposed experimental forest is situated there is available almost every kind of cut-over and burned over ponderosa pine type and also various phases of second growth dating back as far as the early mining days in Boise Basin in the sixties. Eventually, as plans can be developed, representative areas of these cut-over ~~lands should be set aside for use in connection with the experimental forest.~~ ~~of these cut-over lands should be set aside in the experimental forest.~~ No where else in the region is there a locality not already obligated in established working circles that affords such a rich combination of representative sites, variety of conditions for study, accessibility both to market and for work, and opportunity for demonstration purposes as will this particular area when adequately rounded out.

The portion of the proposed experimental forest in Pine Creek drainage in all probability will be cut-over in the near future which will afford some opportunity for the early establishment of method of cutting plots and other studies. The portion in Bannock Creek drainage will be retained for future experimental cutting operations. Since the Bannock timber is the most satisfactory area of virgin timber left in Boise Basin for future experimental cutting it is especially urgent that it be withdrawn from cutting and be set aside for experimental purposes at this time.

II. Description of Area.

(a) The area lies in a solid block within Township 5 North, Range 6 East, Boise Meridian. It is bounded on the north and west by township lines; on the south and east by the natural divide lines marking the limits of the Pine Creek and Bannock Creek drainages. As shown in the accompanying map, it includes all of Sections 5, 6, 7, 8 and 18, nearly all of Sections 16 and 17, and portions of Sections 4, 9, 10, 15, 19 and 20.

(b) The area includes all of that portion of Bannock Creek watershed

that lies within the Boise National Forest boundary and all the easterly portion of the Pine Creek drainage that is within National Forest. Bannock and Pine Creeks are two small tributaries of Moores Creek, into which they flow about two miles northwest of the area. Bannock Creek only will be reserved from commercial cutting operations. Although the National Forest portion of Pine Creek is included, commercial cutting will not be excluded if it is done within the very near future.

(c) The total area is 5,332 acres, of which 3353 acres lies in the Bannock Creek and 1979 acres in the Pine Creek watersheds. Of the total, 1276 acres are classed as unproductive.

III. Acreage by Dominant Cover Types.

	Bannock Creek:	Pine Creek:	Total
	Acres	Acres	Acres
(a) Timberland bearing commercial stands			
Ponderosa Pine Type	1,983	1,788	3,771
Douglas Fir	269	16	285
Total	2,252	1,804	4,056
(b) Timberland bearing non-commercial stands			
Ponderosa Pine	—	—	—
Douglas Fir	126	—	126
Total	126	—	126
(c) Brush Areas, other than Sagebrush	571	175	746
(d) Sagebrush	87	—	87
(e) Grassland	317	—	317
Total "unproductive"	1,101	175	1,276
Total	3,353	1,979	5,332

There are no recent burns of appreciable size on the area. There are several small areas of old burns which have grown up to brush, or bear sapling and pole stands of timber. Exact acreage of these old burns is unknown.

IV. Physical and Climatic Conditions.

(a) Elevations. The absolute elevation ranges from approximately 4,200 feet at the lower end of Bannock Creek to 6,500 feet on the main divides.

(b) Topography. Bannock Creek, which is characteristic of many of the minor drainages of Boise Basin, forms a relatively narrow V-shaped valley with numerous side draws, having irregularly rolling to moderately steep side slopes and is bounded by round-topped ridges. The surface generally is unbroken with only occasional small rock outcrops. The topography of Pine Creek is similar to that of Bannock Creek. From the standpoint of topography the area is moderately easily loggable.

(c) Soils. The soil is a residual gravelly sandy loam which has been derived from the easily disintegrated underlying granite. It is essentially uniform in general character throughout the area, but is normally deepest and of finest texture in the bottoms and on the benches and gentle lower slopes, becoming shallow and very gravelly on steep slopes and ridge tops. It is highly permeable to water and low in moisture holding capacity under normal conditions. The litter cover on the whole is light, varying in depth from practically 0 on some south-facing slopes to 2 inches or more on some of the north-facing, more heavily vegetated slopes.

(d) Precipitation. The average annual precipitation, according to records for the period from 1894 to date, at Idaho City, about 2 miles to the northwest and at an elevation of 4000 feet, is 20.98 inches, of which more than one-half comes as winter snowfall.

(e) The annual mean temperature at Idaho City is 45.4° F. The monthly mean temperature for July, the warmest month, is 67.2°, and for January, the coldest month, it is 24.5° F. The highest and lowest temperatures recorded in the last 12 years are 106° and -28° F. respectively.

(f) The average frost-free period is from June 12 to September 5, or 86 days, but there are occasionally frosts also in July and August.

V. Forest Value.

(a) Silvicultural types. The area was chosen as an average sample of the ponderosa pine type in the south-central Idaho region. In general the stand is virgin and unevenaged, but with the bulk of the volume in mature and overmature trees.

On most south-facing slopes within the timbered zone the stand is practically pure ponderosa pine. Douglas fir, the only associated species, occurs in light mixture throughout the area, but is more abundant along draw and stream bottoms and on northerly aspects. Douglas fir is dominant, forming a distinguishable type at the higher elevations only.

The Douglas fir "protection type" consists of grass and brush land with a very scattered stand of Douglas fir. The stand is too sparse and the trees usually too stunted and limby to form a commercial stand. This type is confined to certain rocky or thin-soiled portions of the higher slopes and ridges at the head of Bannock Creek.

The brush type is a mixture of ceanothus, serviceberry, chokecherry, willow, snowberry, ninebark, stunted aspen and other shrubs having a light admixture of grass and weeds. The composition varies with aspect and soil conditions. Some of the brush patches owe their occurrence to past forest fires.

The sagebrush type is characterized by the key species sagebrush (*Artemisia tridentata*) and bitterbrush (*Purshia tridentata*), associated with various other shrubs, grasses and weeds. Blue-bunch wheat (*Agropyron inermis*) once was an important associate in the sagebrush type, but has been largely destroyed by past overgrazing.

The grass type represents those patches of open land where grasses, particularly blue-bunch wheatgrass now forms, or did form, the prevailing cover. Various weeds and low shrubs are often associated with the grasses.

The brush and grass types generally occupy the higher ridge tops and some of the higher south and west slopes, whereas the commercial timber stands are found along the main streams and draws and on the lower slopes and benches.

(b) Amount and class of timber types. The type and age class acreages are as follows:

TREE AGEAGE

	Bannock Creek			Pine Creek			Total		
	P.	Pine	D.	P.	Pine	D.	P.	Pine	D.
Overmature (160+)	1757	130	1887	1704	-	-	1704	3461	130
Mature (120-160)	35	85	120	-	-	-	35	85	120
Immature (80-120)	78	21	101	-	-	-	78	21	101
Poles (40-80)	-	16	16	30	12	42	30	28	58
Saplings (0-40)	113	15	128	54	4	58	167	19	186
Total	1983	266	2249	1788	16	1804	3771	285	4056

The area has not been classified as to acreage of different sites, but the greater part would grade as site IV, with some areas of site V and probably also some small areas as high as site III.

The estimated total volume in trees 12" and up in diameter breast high is as follows:

	Bannock Creek	Pine Creek
	M. Bd. Ft.	M. Bd. Ft.
Ponderosa Pine	19,935	19,583
Douglas Fir	4,062	2,056
Total	23,997	21,739

The stand of trees below saw timber size is indicated by the following stand table, representing an average acre, pine and fir types combined:

STAND TABLE

	Bannock Creek			Pine Creek		
Class: Ponderosa Pine: Douglas Fir: Total:	P.	Pine	D.	P.	Pine	D.
Number of trees per acre	Number of trees per acre			Number of trees per acre		
2	-	-	-	310.0	112.0	422.0
4	19.3	4.2	23.5	36.8	1.2	40.0
6	2.9	1.8	4.7	11.8	0.7	12.5
8	1.5	1.8	3.3	4.3	0.4	4.7
10	1.3	1.4	2.7	2.0	0.4	2.4
Total	25.0	9.2	34.2	366.9	114.7	481.6

* No data.

(c) Merchantability. Of the total "merchantable" volume given above, it is estimated that about 72 per cent could be removed under present Forest Service cutting practice, indicating about an average degree of merchantability for virgin pine stands. The quality of this saw timber is excellent, except for considerable liminess of some open-grown trees at the

edge of the timber type.

The merchantable stand is generally mature and subject to the characteristic defects, but considering age the timber is very healthy. There is little defect in the pine except for an occasional bark beetle infested tree, and although mistletoe is prevalent in Douglas fir, it offers no serious menace.

(d) Value of timber as protection to watershed. The water from these drainages contributes a very small bit to the irrigation supply of the Boise River; it is not used for domestic supply or other purposes. The plant cover (brush, grass and weeds, as well as trees) is influential in the prevention of erosion and the maintenance of regularity of flow of water in the two small streams involved. The effect of destruction of the cover is forcibly illustrated by the severe washing which took place after logging and a severe fire on a portion of the adjoining Granite Creek watershed. It is believed that the cutting of mature timber under the conservative selection system (particularly if extended over many years as on an experimental forest) will have a negligible effect on streamflow and erosion.

(e) Distribution, extent, and character of reproduction. On the whole, the timbered area is relatively well stocked with thrifty reproduction, but the distribution is by no means ideal. Some areas of several acres, particularly where fire or insects have decimated the mature stand, and numerous smaller patches are covered with thickets of saplings and small poles, but there are other patches where reproduction is very sparse or lacking. The thin-soiled southerly slopes and the border zones at the timber edge are notably lacking in young growth. The predominant species is ponderosa pine, but, as in the major stand, Douglas fir occurs as scattered individuals throughout and is the chief species on certain northerly slopes and coves. Most of the reproduction is of sapling and pole size, ranging probably from 15 to 50 years of age.

(f) Extent and severity of fire damage. As mentioned in the discussion of types, past fires have apparently been responsible for the creation of numerous brush patches and have destroyed all or a portion of the mature timber on certain small areas now bearing young stands. The extent to which they have reduced stocking in the merchantable stand can not be estimated, but it appears to have been no greater here than in the average virgin stand of the region. Many mature trees have been outfaced, which means some loss in merchantable volume, but this form of damage is not particularly serious on this area. The lack of any recent general fires is attested by the fair stand of reproduction on the tract.

(g) Suitability of the area for practical forest management. It is believed that the area can be developed into a satisfactory management unit as an experimental forest. One of the functions of an experimental forest is to provide a working demonstration of a sustained yield operation. This implies annual or at least frequent periodic cuttings. The Bannock Creek drainage would provide less than one year's cut for a large operator. Moreover, the only large operator in Boise Basin will withdraw from this territory within about a year because of exhaustion of accessible timber. Hence it is out of the question to rely upon a large operator for annual or even periodic sales. Consequently there is needed a small mill to operate near the area, which would cut for the limited local market at the mines in Boise Basin and the farms below Boise, Idaho, on a truck to market basis. Rough calculations indicate that a mill with an annual capacity of 300,000 board feet should be able to operate economically in this unit and that such an operation would cut about 35 acres annually. On this basis the 2250 acres of timber in Bannock Creek would supply the cut for approximately the first cutting cycle of 60 years. Meanwhile adjoining areas of partially cut-over land and second-growth stands will have added sufficient growth, which together with some virgin timber in other parts of Boise Basin, will insure the maintenance of the annual cut requirement during the succeeding years. These data are tentative simply to show that the area is of practicable size for management, no exact plan of operation for the tract having been developed as yet. It is reasonable to believe that a private small mill of adequate size will be established within a relatively few years to meet all needs of the experimental forest. The question of whether an operation should be organized along with other divisions of the Mooses Creek Compartment for a large scale operation may safely be left for future decision.

(h) Character and extent of present uses of timber. The timber on this area has not been utilized at all to date. The timber in all of the adjacent portion of Boise Basin has been cut for sawlogs either in various local operations many years ago or recently by the Boise-Payette Lumber Company. All of the recent cut has been shipped out as logs to be cut for lumber in a mill near Boise. There are several large gold and silver mines and small villages in Boise Basin which should provide a local market for at least a portion, but not all of the lumber cut suggested, unless there is a greater development than now anticipated. Such mine ties and timbers as are used are usually cut from material close to the mines. At present there is a fair market for fuel wood in Idaho City and even for hauling to Boise and other valley points, which insures reasonably close utilization of tops, cull logs, and mill slabs.

VI. Agricultural Value.

The area can safely be said to have no agricultural value. The topography is too rough, the soil is too coarse and low in fertility, there is insufficient summer rainfall to support most crops and no reasonable source of irrigation water in quantity, and the growing season is too short for agricultural purposes. About the only crops produced on the few spots which are farmed in Boise Basin are hay, potatoes, and hardy vegetables.

VII. Grazing Value

(a) Numbers of stock grazed under present conditions -

- (1) Cattle - Approximately 200 head of cattle are authorized to graze the proposed experimental forest and approximately that number are on the area for more or less of the grazing season.

(b) Average dates grazing season open and close -

Cattle - May 16 to October 31.

(c) Present conditions of lands used for grazing -

- (1) Percentage understocked - none.
- (2) Percentage stocked to normal capacity - None.
- (3) Percentage overstocked - 100%. Overgrazing is prevalent on the entire usable portion of the area, which is overstocked to the extent of 50 to 100 head of cattle.

(d) Effect of overgrazing.

(1) Upon run-off available for power, irrigation, or navigation - probably negligible because of small area involved.

(2) Upon the permanent grazing value of the area - seriously injurious. The more palatable forage plants have been killed out and replaced by weeds and grasses of less value for grazing. On the steeper south slopes blue-bunch wheatgrass has been replaced by cheat grass (*Bromus tectorum*). Sheet erosion is prevalent on the south slopes. Since north slopes are more heavily timbered and covered with various kinds of brush, no erosion results.

(3) Upon the use of the area for timber production - grazing within the area is not thought to be detrimental to timber reproduction, except indirectly through its deleterious effect on the south slope soils.

(e) Effect of experimental forest on grazing. Present grazing use will have to be reduced in the interest of the range itself. Further reductions will be necessary on account of logging in Pine Creek this year. At the present time there is no objection to proper grazing of the area in so far as the experimental forest is concerned. It possibly affords an opportunity to study the relation of grazing and timber growing. Final action on grazing may safely be left to future consideration.

VIII. Mineral Value.

The area appears to have little or no present or prospective mineral

value, in spite of the fact that Boise Basin has been one of the richest gold-producing areas in the country. Throughout the entire valley floor of Moores Creek near Idaho City, many of the side drainages, and some of the foothills have been repeatedly placered, but the operations never extended far up Bannock and Pine Creeks. There are several producing quartz mines and innumerable claims in the west and north portions of the Basin, but none in the vicinity of the proposed experimental forest. The area has been thoroughly combed by prospectors, who have found nothing worthy of development.

IX. Value of Area for Other Public Uses.

(a) Hydroelectric power - no value.

(b) Reservoir development in interest of irrigation - no value.

(c) Public recreation. The area is and will be relatively free from recreational use. No travelled roads pass through the area. Boise Basin, although a well timbered country, offers no unusual scenic attractions to tourists and campers. A few deer hunters may be expected, but the majority of them seek the much better hunting grounds in the North Fork or the Payette River country to the east and north. The streams on the area are too small for fishing, and there are very few fish even in any of the larger creeks of Boise Basin.

(d) Other uses - none.

X. Transportation Facilities.

At present the area is served by auto and truck traffic over a typical mountain country road connecting Idaho City and Boise, a distance of 40 miles. This road is gradually being replaced by a highway which will eventually link Boise, Idaho and Missoula, Montana - a scenic route which should carry considerable summer travel. Construction of a twenty-mile section above Idaho City is under way.

From Idaho City, access to the area is by a poor unimproved dirt road up Bannock Creek to the Forest boundary. Thence an improved trail and telephone line pass up the creek and over the divide at the head to Meadow Creek. Another good trail and telephone line pass along the divide between Bannock and Pine Creeks, and over the head of the drainage to Thorn Creek, Bald Mt. lookout, and Cottonwood Creek. Fair roads can be developed cheaply after the abandonment of the logging spur grades along Pine Creek and within one-fourth mile of the Forest boundary on Bannock Creek. The easy gradient of Bannock Creek above this point to near the head of the stream will make further road construction relatively simple. Thus the prospects for a transportation system within the area are ~~exceedingly~~ good.

The nearest shipping point by rail is Stierman, Idaho, 16 miles south along Moores Creek. This railroad is owned and operated by the Boise-Payette Lumber Company, which at present also maintains a logging branch to the edge of the Pine Creek area, where they are now operating. The logging branch will probably be abandoned within a year, and the Boise-Stierman line within five years if permission is granted by the public utilities commission. If such is the case, Boise, 40 miles distant, will be the rail shipping point.

XI. Public Sentiment.

The general attitude of the public is favorable to the establishment of the experimental forest. Lumbermen and other timberland owners in this part of Idaho are interested because the results of such experiments and demonstration work as would be conducted here promise to help them directly in their forest management problems. No objections to this specific area have been heard. Although the reservation of the timber in Bannock Creek drainage will mean the withdrawal of the present large scale operations from Boise Basin a few months earlier than otherwise, the more far-sighted local residents will appreciate that the permanent local activity and opportunity for employment that the experimental forest will provide, in the long run will be worth more to the community than a few weeks of logging.

XII. Protection.

The administration and protection of this site at present is from Idaho City, which is the headquarters of the district ranger, a guard, and fire dispatcher. However, the area in itself is not now considered a high hazard area, due to the character of the slopes

and the men available for suppression. The general hazard has recently been increased somewhat by the leaving of slash following logging on surrounding private and state lands, but if this is given due protection the danger should be diminished within a few years. Research will need only to afford local protection and probably inspect the higher ridges following a lightning storm. Patrols are not necessary because the area is not considered a recreation possibility. The administrative lookout system covers this area from a guard-lookout headquarters on the divide at the head of the creek. Two telephone lines pass through the area, one to the lookout, the other to guard and ranger stations on the east side of the forest.

An excellent natural break is afforded on the west by large gravel dumps, the result of extensive gold dredging. Other than this only the ridges, some open and some timbered, afford a fire break of any sort. The development of supplementary artificial firebreaks may eventually prove desirable.

XIII. Improvement Possibilities.

The area in itself does not offer a completely satisfactory site for headquarters buildings, nursery, etc., such as will doubtless be desired, but this lack need not be a deterrent factor. One suitable site lies on Bannock Creek, just below the forest boundary. Another would be at or near the present site of the logging camp near the mouth of Bannock Creek, possibly along the new highway which will pass in that vicinity. Either of these sites would have to be acquired by gift or exchange, but both are within an area of cut-over land and second growth that will be desirable for addition to the experimental forest. Still another possibility is to place the headquarters in Idaho City (no government land available),

but that has few advantages and would be some distance from the place of work.

Bannock Creek would supply sufficient water for station use. Electric power could be obtained by connection with the line which now serves Boise Basin. Forest Service telephone lines are already on the area. Idaho City, with a population of about 200, offers the usual facilities of such a small town - postoffice, stores, hotel, and a convenient source of local labor.

XIV. Relation of Area to the Future Use of the Resources of the Adjacent National Forest Lands.

The experimental forest will in no way involve the future use of resources of the adjacent national forest lands. The timber on all adjacent lands has been cut-over in recent years and plans for the second cut when that time arrives, can be made up, at no material disadvantage, to exclude the timber on the experimental forest. The grazing use of the area may be left to future decision, the outcome of which will not materially involve the grazing on adjacent lands. There are no material recreational resources on the area, and it does not influence the use of other recreational areas. Watershed protection will be maintained to as good or even better advantage under experimental forest use than under regular administration. Protection against fire of adjacent forest lands will not be reduced or interfered with. There are no known mineral resources on the area to complicate future use. The area is never likely to involve the location of a highway or other transportation route objectionable to its use as an experimental forest.

Submitted March 28, 1933.

R. L. Smith
Director, Intermountain Experiment Station

Approved *Apr 8* 1933

R. L. Smith
Regional Forester

Approved *June 6* 1933

R. L. Smith
Forester

L. O. K.